

Unit Planning Guide: Grade Geometry Unit 1 of 8

Unit Title: Transformations and Constructions	Pacing (Duration of Unit): 20 days
Grade: Geometry	Buffer Day(s): 5 days

Desired Results

Transfer Goals (Priority practice standards in **bold**)

Students will be able to independently use their learning to:

- MP.1. Make sense of problems and persevere in solving them.
- MP.2. Reason abstractly and quantitatively.
- MP.3. Construct viable arguments and critique the reasoning of others.
- MP.4. **Model with mathematics.**
- MP.5. **Use appropriate tools strategically.**
- MP.6. **Attend to precision.**
- MP.7. Look for and make use of structure.
- MP.8. Look for and express regularity in repeated reasoning.

Established Goals (2011 MA Curriculum Frameworks Standards Incorporating the Common Core State Standards)

Prerequisite Standards:

- 8.G.1 – Verify experimentally the properties of rotations, reflections, and translations.
- 8.G.2 – Understand that a two dimensional figure is congruent to a figure if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.
- 8.G.3 – Describe the effects of dilations, translations, rotations, and reflections on two dimensional figures using coordinates
- A-SSE.1 – Interpret expressions that represent a quantity in terms of its context.
- A-CED.1 – Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.
- A-REI.1 – Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution.
- A-REI.3 – Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

WIDA for English Language Learners

Standard 1: ELLs **communicate** for **Social** and **Instructional** purposes within the school setting

Standard 3: ELLs **communicate** information, ideas and concepts necessary for academic success in the content area of **Mathematics**

In the lesson planning stage, teachers will need to differentiate lessons for ELLs. In order to accomplish this they will need: 1.) this curriculum map, 2.) a list of their ELLs and their proficiency levels, and 3.) appropriate language function

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Standards (Priority Standards in **bold**):

- **G-CO.1** Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.
- **G-CO.2** Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).
- **G-CO.6** Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.
- **G-CO.12.** Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). *Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.*
- G-CO.3. Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.
- G-CO.4 Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.
- G-CO.5 Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.
- G-CO.13 Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.
- G-C.MA.3a. Derive the formula for the relationship between the number of sides and sums of the interior and sums of the exterior angles of polygons and apply to the solutions of mathematical and contextual problems.

expectations and scaffolds or supports.

Meaning (*Mostly assessed through Performance Tasks/Assessments)

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<p>Big Ideas: (Statements and concepts written in teacher friendly language which reflect the important [but not obvious] generalizations we want students to be able to arrive at. These are used by the teacher to focus daily instruction.)</p> <ul style="list-style-type: none"> Knowing defined and undefined terms in geometry allows connections to be made among the dimensionality of figures. When all dimensional figures are transformed through rigid motion, then congruence is maintained. 	<p>Essential Questions: (Questions which frame ongoing and important inquiries about the big ideas. They are written for students and used in daily instruction to help engage students in meaningful thinking.)</p> <ul style="list-style-type: none"> How can we create higher dimensions? How do figures transform?
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Acquisition (*Mostly assessed through traditional summative assessments)	
<p>Knowledge: Key basic concepts, facts, and key terms (written in phrases) students should be able to recall independently.</p> <p><i>Students will know ...</i></p> <ul style="list-style-type: none"> the relationship among dimensions (0-d, 1-d, 2-d, etc). the definition of: points, planes, lines, rays, line segments, angles, parallel lines, perpendicular lines, and congruence with respect to segments and angles the meaning of intersections of figures the difference between postulates and theorems the significance of the relationship between polygons and their sides/angles rigid transformations create congruent figures through translations, rotations, and reflections (*<i>dilations were omitted purposefully to build a bridge to transformations in the similarity unit</i>) <p>Words in bold are new or recent key academic vocabulary</p>	<p>Skills: The discrete skills and process students should be able to use independently.</p> <p><i>Students will be skilled at:</i></p> <ul style="list-style-type: none"> visualizing and constructing figures in 0, 1, 2 and 3 dimensions, including angles, segments, lines (parallel & perpendicular), bisect segments and angles (<i>Comprehension and Application</i>) naming points, lines, rays, segments, angles, and planes (<i>Comprehension</i>) applying postulates and theorems to measure segments and angles (<i>Application</i>) comparing congruence of segments and angles (<i>Comprehension</i>) classifying angles as acute, obtuse, right, straight, and reflex (<i>Knowledge</i>) deconstructing a diagram of points, lines, rays, planes, and angles (<i>Analysis</i>) identifying and classifying polygons (<i>Knowledge and Comprehension</i>) translating a figure horizontally and vertically (<i>Application</i>) rotating a figure about a point on a coordinate plane (<i>Application</i>) reflecting a figure over a line (<i>Application</i>) predicting rigid motions on a figure (<i>Synthesis</i>)

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Resource Suggestions:

GEOMETRY 2007

McDougal Littell

Chapter 1: Essentials of Geometry

1.1

1.2

1.3

1.4

1.5

1.6

Chapter 8: Quadrilaterals

8.1

Chapter 9: Properties of Transformations

9.1

9.3

9.4

9.5